

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
13 May 2004 (13.05.2004)

PCT

(10) International Publication Number  
**WO 2004/040096 A1**

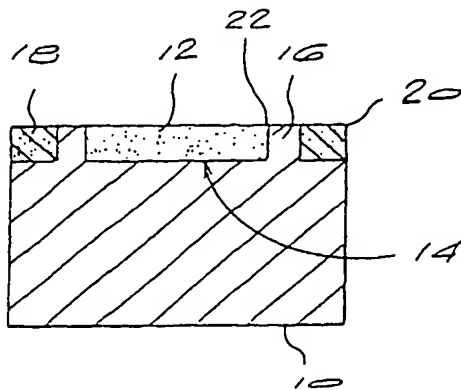
- (51) International Patent Classification<sup>7</sup>: **E21B 10/56**, 29/06
- (74) Agents: DONALD, HEATHER, June et al.; Spoor & Fisher, P.O. Box 41312, 2024 Craighall (ZA).
- (21) International Application Number: PCT/TB2003/003921
- (22) International Filing Date: 12 September 2003 (12.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 2002/8778 30 October 2002 (30.10.2002) ZA
- (71) Applicant (for all designated States except US): **ELEMENT SIX (PROPRIETARY) LIMITED [ZA/ZA]**; Debid Road, Nuffield, 1559 Springs (ZA).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **TANK, Klaus [ZA/ZA]**; 9 Warbleton Avenue, Essexwold, 2001 Johannesburg (ZA). **CHAPMAN, Raymond, Albert [ZA/ZA]**; 183 Columbine Avenue, Mondeor, 2001 Johannesburg (ZA). **ACHILLES, Roy, Derrick [ZA/ZA]**; 608 San Martinho, Leicester Road, 2007 Bedfordview (ZA).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **COMPOSITE TOOL INSERT**



(57) **Abstract:** A tool insert comprises a substrate (10) having a support surface and a support ring extending laterally from the support surface. The support ring is sized to define a recess (14) within the confines thereof and a shelf about the periphery thereof. A layer (12) of ultra-hard abrasive material is located within the recess and bonded to the substrate and the support ring (16), and presents a primary cutting edge (22) for the tool insert. A protective layer (18) is bonded to the shelf about the support ring so as to protect the primary cutting edge. The protective layer provides a secondary cutting edge (20) for the tool insert, the depth of the protective layer being selected so as to be sufficient to protect the primary cutting edge whilst cutting, milling or drilling through a first substance but to expose the primary cutting edge upon encountering a second substance.



WO 2004/040096 A1